ENU 4905 – INDIVIDUAL WORK

Course Syllabus – Spring 2026

	Office	E-Mail	Office Hours
Professor: Justin Watson	135 A Rhines Hall	justin.watson@ufl.edu	TBD

Course Description (3 credit hours)

In depth study of nuclear reactor core loading pattern design, neutronics analysis, and graphical user interface development.

Prerequisites:

Consent of research advisor or undergraduate coordinator

Course Objectives:

The focus of this course is an understanding of how nuclear reactor core designs are developed and the software used to create them.

Meeting Times:

Tuesday	Period	4	10:40-11:30	135 A Rhines Hall

Assignments:

Assignment 1: NEM full core model development.

Assignment 2: Report on various PWR core loading patterns and their impact on critical core parameters.

Assignment 3: Report on the use of simulated annealing and genetic algorithms for use in developing core loading patterns.

Assignment 4: Semester project, development of a graphical user interface for the Florida Loading pattern Optimizaiton Workbench (FLOW).

Assignment 5: One full length technical paper. The paper should be at least 10 pages in length. It should be in an acceptable technical style, i.e., Title, Abstract, Introduction, Technical background (if required), Discussion, Conclusions, References.

Grading:

Assignment 1	10%
Assignment 2	20%
Assignment 3	20%
Assignment 4	40%
Assignment 5	10%

Grading Scale

This course follows current UF grading policies for assigning grade points

Percentage	≥92	≥88	≥84	≥80	≥76	≥72	≥68	≥65	≥62	≥59	≥56	<56
Letter Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	E
Grade Points	4.0	3.67	3.33	3.0	2.67	2.33	2.0	1.67	1.33	1.0	0.67	0

Office Hours

Office hours will be held in 135 A Rhines Hall on Wednesdays from 3-5 pm. If there are any specific questions about research and coursework, please come to office hours or send me an e-mail.

Honesty Policy

All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a re-minder to uphold your obligation as a UF student and to be honest in all work submitted and exams taken in this course and all others. Note that failure to comply with this commitment will result in disciplinary action compliant with the UF Student Honor Code Procedures.

See general regulations in the 2017-2018 graduate catalog section on academic integrity http://gradcatalog.ufl.edu/content.php?catoid=11&navoid=2486

Accommodation for Students with Disabilities

Students Requesting classroom accommodation must first register with the Dean of Students Office. That office will provide the student with documentation that he/she must provide to the course instructor when requesting accommodation. UF Counseling Services Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include:

•UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services.

•Career Resource Center, Reitz Union, 392-1601, career and job search services.

Your well-being is important to the University of Florida. The U Matter, We Care initiative is committed to creating a culture of care on our campus by encouraging members of our community to look out for one another and to reach out for help if a member of our community is in need. If you or a friend is in distress, please contact umatter@ufl.edu so that the U Matter, We Care Team can reach out to the student in distress. A nighttime and weekend crisis counselor is available by phone at 352-392-1575. The U Matter, We Care Team can help connect students to the many other helping resources available including, but not limited to, Victim Advocates, Housing staff, and the Counseling and Wellness Center. Please remember that asking for help is a sign of strength. In case of emergency, call 9-1-1.

Software Use

All faculty, staff and student of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate. We, the members of the University of Florida community, pledge to uphold ourselves and our peers to the highest standards of honesty and integrity.

Record keeping

All materials from this class that students did not pick up (graded exams, etc.) within 1 year of the end of class will be shredded on or after April 30, 2027.

Course Schedule/Plan

Week 1:	Introduction and Overview of Nodal Methods for Reactor Analysis
Week 2:	Nuclear Cross Sections for Nodal Methods Intro To Semester Project
Week 3-5	Depletion calculations Assignment 1 Due
Week 6-8	Nuclear Core loading Patterns Assignment 2 Due
Week 9-10	Methods for Loading Pattern Optimization Assignment 3 Due
Week 11-13	Nuclear Reactor Core Safety Parameters Assignment 4 Due

Week 14-15:	Report writing and lessons learned Assignment 5 Due